

REMARKS

Please enter and consider the foregoing amendment. Claims 1-4, 7, 11, 15-20 and 26 are pending in the application. Applicants have amended claims 1, 11, 17, 18 and 20. Claims 6, 8, 9, 10, 12, 13 and 14 have been canceled. Support for the amendments to claim 1 is found in the specification at least on page 3, lines 14-30 and in FIGS. 3A through 3C. Applicants respectfully submit that no new matter is introduced. In view of the foregoing amendment and following remarks reconsideration and allowance of the presently pending claims is respectfully requested.

Claim Objections

Claim 6 is objected to as being of improper dependent form for failing to further limit the subject matter of the previous claim. Claims 8-14 are objected to as being dependent on an objected-to base claim. Claim 17 is objected to because the feature of "the encapsulation of the detector" allegedly has no antecedent basis. Claim 18 is objected to because it is apparently intended to read "aperture between the coder and the imaging lens."

Applicants have canceled claims 6, 8-10 and 12-14. Applicants have amended claim 11 to depend from claim 4. Applicants have also amended claim 17 to read "the encapsulation of the image detector" and have amended claim 18 to read "an aperture between the coder and the imaging lens." Accordingly, Applicants respectfully request that the objections be withdrawn.

Response to 35 U.S.C. § 112 Rejections

Claims 1-4, 6-20 and 26 stand rejected under 35 U.S.C. § 112, Second Paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention.

Applicants have canceled claims 6, 8-10 and 12-14. Applicants have also amended claim 1 to recite "an encapsulated emitter mounted on the substrate, the encapsulated emitter comprising a light emitting element and an encapsulant, wherein the encapsulant has an encapsulant optical axis and the light emitting element is mounted offset from the encapsulant optical axis, the encapsulated emitter having an emitter optical axis and emitting light that is offset from the emitter optical axis."

Accordingly, Applicants respectfully submit that claims 1-4, 7, 11, 15-20 and 26 are in compliance with 35 U.S.C. § 112, Second Paragraph, and respectfully request that the

rejection be withdrawn.

Response to 35 U.S.C. § 103 Rejections

Claims 1-4, 6-17 and 26

Claims 1-4, 6-17 and 26 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 4,587,513 to Burrowes *et al.* (hereafter *Burrowes*) in view of U.S. Patent No. 5,317,149 to Uebbing *et al.* (hereafter *Uebbing*) and U.S. Patent No. 6,603,115 to Gordon-Ingram (hereafter *Gordon-Ingram*). For a claim to be properly rejected under 35 U.S.C. §103, “[t]he PTO has the burden under section 103 to establish a *prima facie* case of obviousness. It can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references.” *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988) (citations omitted). Further, “[t]he mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification.” *In re Fritch*, 972 F.2d 1260, 1266, 23 U.S.P.Q.2d 1780 (Fed Cir. 1992).

Claim 1

It is stated in the Office Action that:

Burrowes teaches in Figure 1 a reflective imaging encoder comprising an emitter (16) emitting light, a diffuse reflective coder (15) reflecting light from the emitter (16), an imaging lens (20) forming an inverted imaging of the reflected light from the coder (15), and a detector (22) receiving the inverted image from the imaging lens (20). *Burrowes* does not teach that the emitter (16) and the detector (22) are mounted on a common substrate. *Uebbing* teaches in Figure 2 that the emitter (8) and the detector (22) are mounted on a common substrate. It would have been obvious to one of ordinary skill in the art at the time of the invention to mount the emitter and detector on a common substrate in *Burrowes*, as taught by *Uebbing*, to provide an integrated system and stabilize alignment. *Burrowes* does not teach that the detector is an imaging detector. *Gordon-Ingram* teaches in Figure 1 an absolute position encoder comprising a CCD detector (5) and further teaches in column 5 lines 34-37 that any array of photodetectors could be used, as well as other bit detectors. It would have been obvious to one of ordinary skill in the art at the time of the invention to use an imaging detector in *Burrowes*, as taught by *Gordon-Ingram*, based on the desired detector characteristics. *Burrowes* does not teach a light baffle. It would have been obvious, however, to one of ordinary skill in the art at the time of the invention to use a light baffle in *Burrowes*, to prevent ambient light from affecting the measurements, thus improving the overall accuracy of the system and minimizing noise.

Burrowes discloses an apparatus and method for non-contact determination of shaft angle that uses a patterned disc secured to the shaft or other rotor being observed. The disc has sectors of different optical properties whereby radiant energy directed to the disc will be encoded by the sectorized pattern. *See Burrowes*, Abstract.

Uebbing discloses an encapsulated reflective sensor for use in conjunction with a code wheel for determining motion and position of a shaft. The sensor has a light emitting device and a photodiode array contained within a transparent encapsulant. The encapsulant has a convex curved surface which prevents light from the light emitting device from impinging on the photodetector array. *See Uebbing*, Abstract. However, *Uebbing* describes only an embodiment in which a light emitting device is located on the optical axis of a lens.

Gordon-Ingram discloses a scale and scale reader which may be used to determine absolute position of the reader with respect to the scale in two directions. *See Gordon-Ingram*, Abstract.

Applicants have amended independent claim 1 to recite at least “an encapsulated emitter mounted on the substrate, the encapsulated emitter comprising a light emitting element and an encapsulant, wherein the encapsulant has an encapsulant optical axis and the light emitting element is mounted offset from the encapsulant optical axis, the encapsulated emitter having an emitter optical axis and emitting light that is offset from the emitter optical axis.” At least this feature is not disclosed, taught nor suggested by the proposed combination.

With respect to the Examiner’s statement that “[r]egarding claim 10, *Uebbing* teaches in Figure 4 that the light emitting diode (8) is mounted offset from the optical axis,” Applicants respectfully submit that *Uebbing* fails to remedy the defects of *Burrowes* in that the proposed combination fails to disclose, teach or suggest at least Applicants’ “encapsulated emitter mounted on the substrate, the encapsulated emitter comprising a light emitting element and an encapsulant, wherein the encapsulant has an encapsulant optical axis and the light emitting element is mounted offset from the encapsulant optical axis, the encapsulated emitter having an emitter optical axis and emitting light that is offset from the emitter optical axis,” as recited in claim 1.

Specifically, Fig. 4 of *Uebbing* shows that the light emitting device 8 is located in line with the optical axis of the lens surface 6. Similarly, the plan view of Fig. 1 of *Uebbing* also shows that the light emitting device 8 is located directly in the center of the lens surface 6. Specifically, *Uebbing* states that “[i]n this single lens embodiment, the LED is placed on the

vertex of the lens.” See *Uebbing*, col. 4, lines 50-51. Neither does Fig. 2 of *Uebbing* show any change in the direction of the light emitted from the light emitting device 8 as the pattern of illumination 36 passes through the lens surface 6.

For at least the reasons stated above, Applicants respectfully submit that the proposed combination fails to disclose, teach or suggest each element in independent claim 1. Further, Applicants respectfully submit that dependent claims 2-4, 7, 11, 15-17 and 26 are allowable for at least the reason that they depend from allowable independent claims. *In re Fine, supra*.

Claims 18-20

Claims 18-20 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Burrowes* in view of *Uebbing*, as applied to claim 1, and further in view of U.S. Patent Application Publication No. 2002/0195550 to McQueen (hereafter *McQueen*).

McQueen discloses “a given aperture setting defined by aperture stop 110, where the lens plate 102 is parallel to the image plane 103.” See *McQueen*, par. 0039.

Applicants respectfully submit that the proposed combination of *Burrowes* in view of *Uebbing* and *McQueen* fails to disclose teach or suggest all of the elements in claim 1. Specifically, the proposed combination fails to disclose, teach or suggest at least an “encapsulated emitter mounted on the substrate, the encapsulated emitter comprising a light emitting element and an encapsulant, wherein the encapsulant has an encapsulant optical axis and the light emitting element is mounted offset from the encapsulant optical axis, the encapsulated emitter having an emitter optical axis and emitting light that is offset from the emitter optical axis,” as recited in claim 1. Further, Applicants respectfully submit that the proposed combination fails to disclose, teach or suggest all the elements in dependent claims 18-20.

Furthermore, Applicants respectfully submit that dependent claims 18-20 are allowable for at least the reason that they depend from an allowable independent claim 1. *In re Fine, supra*.

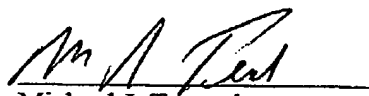
CONCLUSION

In summary, Applicants respectfully request that all outstanding claim rejections be withdrawn. Applicants respectfully submit that presently pending claims 1-4, 7, 11, 15-20 and 26 are allowable and that the present application is in condition for allowance. Accordingly, a Notice of Allowance is respectfully solicited. Should the Examiner have any comment regarding the Applicants' response or believe that a teleconference would expedite prosecution of the pending claims, Applicants request that the Examiner telephone Applicants' undersigned attorney.

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